

WHAT IS CLAIMED IS:

1. A method of forming a bottom electrode of a magnetic memory cell, comprising;  
before depositing a soft layer material, depositing a sacrificial mask over a bottom  
electrode material;

5        patterning the sacrificial mask;

      patterning the bottom electrode material; wherein the sacrificial mask is almost  
completely consumed after the patterning of the bottom electrode material.

2. The method according to Claim 1, wherein the sacrificial mask comprises photoresist, an  
10    oxide, or a low dielectric constant material.

3. The method according to Claim 1, wherein the sacrificial mask comprises a thickness of 1000  
to 5000 Angstroms.

15    4. The method according to Claim 1, wherein the bottom electrode material comprises a first  
conductive material and a second conductive material formed over the first conductive material.

5. The method according to Claim 4, wherein the first conductive material comprises a layer of  
Ta and a layer of TaN.

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6. The method according to Claim 5, wherein the first conductive material comprises 50-100  
Angstroms of Ta and 50-100 Angstroms of TaN.

7. The method according to Claim 4, wherein the second conductive material comprises PtMn or IrMn.

8. The method according to Claim 7, wherein the second conductive material comprises 125 to  
5 300 Angstroms of PtMn or IrMn.

9. A method of fabricating a magnetic memory device, comprising;

providing a workpiece;

depositing a first insulating layer over the workpiece;

forming a plurality of first conductive lines within the first insulating layer;

5 disposing a bottom electrode material over the first conductive lines and the first insulating layer;

depositing a sacrificial mask over the bottom electrode material;

patterning the sacrificial mask; and

10 using the sacrificial mask to pattern the bottom electrode material and form at least one bottom electrode for a magnetic memory cell, wherein at least a portion of the sacrificial mask is consumed during the patterning of the bottom electrode material, and wherein the bottom electrode is patterned prior to depositing a soft layer of the magnetic memory device.

15 10. The method according to Claim 9, further comprising depositing a soft layer over the patterned bottom electrode, after patterning the bottom electrode material.

11. The method according to Claim 10, further comprising depositing a hard mask over the soft layer.

20 12. The method according to Claim 11, further comprising patterning the hard mask, and using the hard mask to pattern the soft layer, wherein the patterned soft layer comprises a magnetic memory cell.

13. The method according to Claim 12, further comprising:

depositing a second insulating layer over the first conductive lines and first insulating layer;

patterning the second insulating layer with a via pattern;

5 filling the patterned second insulating layer with conductive material to form a via contacting at least one first conductive line, wherein the via makes electrical contact with a bottom portion of the magnetic memory cell;

depositing a third insulating layer over the patterned bottom electrode; and

forming a plurality of second conductive lines in the third insulating layer, wherein at  
10 least one second conductive line makes electrical contact to an upper portion of the magnetic memory cell.

14. The method according to Claim 9, wherein disposing the bottom electrode material comprises depositing a first conductive material over the first conductive lines and the first  
15 insulating layer, and depositing a second conductive material over the first conductive material.

15. The method according to Claim 14, wherein depositing the first conductive material comprises depositing 50-100 Angstroms of Ta over the first conductive lines and the first insulating layer and depositing 50-100 Angstroms of TaN over the Ta.

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16. The method according to Claim 14, wherein depositing the second conductive material comprises depositing 125 to 300 Angstroms of PtMn or IrMn over the first conductive material.

17. The method according to Claim 9, wherein the sacrificial mask comprises photoresist, an oxide, or a low dielectric constant material.

5 18. The method according to Claim 9, wherein the sacrificial mask comprises a thickness of 1000 to 5000 Angstroms.

19. The method according to Claim 9, wherein the sacrificial mask is almost completely consumed during the patterning of the bottom electrode material, further comprising removing remaining portions of the sacrificial mask after patterning the bottom electrode material.

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20. The method according to Claim 9, wherein after the patterning of the bottom electrode material, the sacrificial mask has been completely removed.